



COMPUTER SYSTEM DESIGN

INFORMATION SHEET 1.1-3

LEARNING OBJECTIVES

1. select computer components based on the customer's needs
2. identify the components best suited for a particular computing environment
3. know how to design for specific computer subsystems, such as the video or storage subsystem



INTRODUCTIONS

Computer users need different types of computer systems.

What the user does with the computer dictates the components and peripherals needed. Looking at the computer systems by purpose is a good place to start with design.



CAD/CAM and Graphics Design Workstations

Computer-aided design (CAD) and computer-aided manufacturing (CAM) systems are used in manufacturing plants by engineers or design engineers to create things.

A graphics/CAD/CAM design workstation would need the following key components:

**Powerful multi-core
processor(s)**

Max system RAM

High -end video cards

SSD storage

**Quality mouse and
keyboard**

Gaming PCs

Gaming computers are a set of their own. Gamers frequently build their own systems, but some computer manufacturers do make gaming PCs.

A gaming PC would need the following key components:

Powerful multi-core processor(s)

Max system RAM

High -end video cards

SSD storage

HD sound card and speakers

High end cooling system

Audio/Video Editing Workstations

An audio/video editing workstation (see Image 4) is used to manipulate sounds (shorten, add, overlay, and so on) or video. This type of system requires a lot of hard drive space and RAM.

Here are the most common configuration elements for such a computer:

**Powerful multi-core
processor(s)**

Max system RAM

**High -end video cards
with max RAM and GPU**

SSD storage

**Specialized HD sound
card and speakers**

Dual monitor

Virtualization Workstations

A virtualization workstation can mean two things: (1) a workstation that has at least one operating system, in its own virtual machine that is separate from the host operating system. or (2) a workstation that uses hardware and software virtualization techniques to provide an end user with a controlled workstation environment

Here are the most common configuration elements for such a computer:

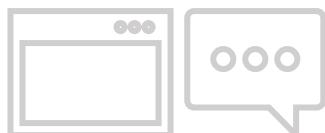
**Powerful multi-core
processor(s)**

**Network-attached
storage (NAS)**

Max RAM

SSD storage

**Specialized HD sound
card and speakers**



Thin Client Workstations

A thin client workstation is a desktop or laptop that has a display, mouse, keyboard, and network connectivity and runs applications from a server.

Thin client computers are less expensive than a normal workstation (but the network infrastructure such as servers, software, storage area network [SAN], and so on to support thin clients costs money).

Here are the most common configuration elements for such a computer:

Meet minimum requirements

Basic apps

1Gb/s preferred network connectivity



Thick Client Workstations

In contrast to a thin client workstation, a thick client computer is the most common type of desktop or laptop in the work environment. Applications are installed and documents are commonly stored on the local hard drive. An all-in-one computer could be a thick client computer. Computers in small businesses tend to be thick client workstations.

A standard thick client computer has the following characteristics:

Meet minimum hardware requirements

Meet minimum software requirements

Optional dual display

Home Servers

A home server computer is used to store data, function as a web server, print server, or file server, control media streaming, be accessible from outside the home, control devices, and manage backups of other computers.

Typical components found in a home server include the following:

**Multiple hard drives
in a RAID array
configurations**

1Gb/s connections

**Server apps including
media streaming, file
and print sharing**

Multiple processors

**Maximum
capacity of RAM**

**Network-attached
storage**



Industrial Computers

An industrial computer is one used for a specific industry. For example, in a car repair shop, the standard computers used both inside the showroom and in the service and repair center might be in an enclosure or have keyboard coverings.

Here are some things to consider for an industrial computer:

Optional enclosure for wet, dry, or outdoor environments

Optional enclosure for a laptop's external keyboard and mouse

Meets recommended hardware requirements based on applications

Optional LCD enclosure for harsh, outdoor, public, high-traffic, or industrial environments

Optional privacy display screen

Case with air filters that may be removable for cleaning.



Mobile computers

A mobile computer for someone who travels as part of his job also needs special design considerations.

Considerations for an “on-the-road” computer design include the following:

Laptop, Ultrabook, or tablet Sufficient RAM
Might need mobile broadband connectivity

Possible SSD (if shaking or dropping due to handling is a concern or if high speed is needed)

Possible projector
Possible thermal printer for sales-oriented tasks

Compatible smartphone

Possible portable speakers and headphones with noise cancellation

thank you!

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